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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/659,379 | 09/11/2003 | Motoaki Matsuda | Q77402 | 2997 |

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WASHINGTON, DC 20037

EXAMINER

NHU, DAVID

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 2818 | |

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,379

Applicant(s)

MATSUDA, MOTOAKI

Examiner

David Nhu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

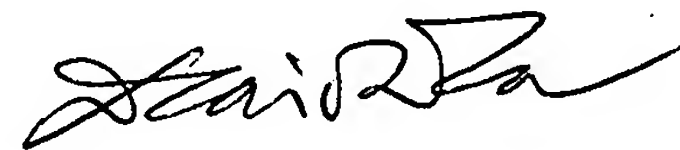
Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.



Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAIL ACTIONS

Drawings

1. There are no gaps (17) in figure 4.

Claims Objection

2. Claims 1, 2, 3, 4, 5, "**the surface, the area, the ends, the width, the widths, the area**" lack a clear basis antecedent.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1-6 are rejected under U.S.C 103(a) as being unpatentable over Carden et al (6,224,711 B1) in view of Shiozawa (6,391,686 B1).

Regarding claim 1, Carden, figures 1-4, and related text on col. 1-8, (figures 1-2, col. 3, lines 5-64), disclose a flip-chip Ball Grid Array (BGA) semiconductor device in which a semiconductor chip 4 is mounted on a substrate 2 by a reflow process; comprising a stiffener 8 that is bonded by means of adhesive 10 to the area surrounding said semiconductor chip on a surface of said substrate on which said semiconductor chip is mounted.

It is noted that Carden fails to teach wherein gaps are provided between said stiffener and said substrate that each extend outwardly from portions that confront opposite sides of said semiconductor chip and that communicate with ends of said substrate.

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However, Shiozawa, figures 1-37, col. 1-20, (figures 3-5, col. 8, lines 25-67), teach wherein gaps 15 are provided between said stiffener 14 and said substrate that each extend outwardly from portions that confront opposite sides of said semiconductor chip and that communicate with ends of said substrate.

Regarding claims 2-6, Carden, col. 1-8; Shiozawa, col. 1-20, also teach wherein one/both of said gaps/spaces on two sides of said semiconductor chip is provided across a width/widths of sides of said semiconductor chip that said gaps confront; wherein said gaps/spaces are formed by depressions that are provided in a surface of said substrate on which said semiconductor chip is mounted; wherein said adhesive is not provided in portions in which said depressions are formed.

It would have been obvious to one having ordinary skill in the art at the time of the present invention to apply the teachings of Shiozawa into Carden as both are related to the same subject matter of assembling a flip-chip package by a reflow process, comprising patterned stiffeners that are bonded by adhesive material to a chip wherein gaps/spaces are provided between the stiffeners and the substrate.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Sasaki'851, Sugimoto'646 are cited as of interest.

6. A shortened statutory period for response to this action is set to expired 3 (three) months from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see 710.02 (b)).

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7. Any inquiry concerning this communication on earlier communications from the examiner should be directed to David Nhu, (571)272-1792. The examiner can normally be reached on Monday-Friday from 7:30 AM to 5:00 PM. The examiner's supervisor, David Nelms can be reached on (571)272-1787.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956

David Nhu

March 22, 2004